Questions 2

1. The two nearest stars, Proxima and Alpha Centauri, have apparent visual magnitudes, m_V, of 11.0 and 0.0 respectively. How many times fainter is Proxima than Alpha Centauri?

2. Proxima and Alpha Centauri are at a distance of 1.3 pc. What are their absolute visual magnitudes and are they intrinsically brighter or fainter than our Sun?

3. Two stars have apparent visual magnitudes of 7.9 and 8.6. If they were significantly close on the sky that they appeared as one star what would be its magnitude?

4. A star with apparent visual magnitude of 13.3 has its colour measured to be B-V=+0.45±0.15. What can you deduce about its distance making certain assumptions using the data in table below?

TABLE A4–3 Stellar Characteristics by Spectral Type and Luminosity Class

Spectral Type	M_v			$B-V$			T_{eff} (K)			BC	$R/R_\odot$			$M/M_\odot$		
	V	III	Ib*	V	III	I	V	III	I	V	V	III	I	V	III	I
O5	−6.0			−0.32	−0.32	−0.32	50,000			−4.30	18			40		100
B0	−4.1	−5.0	−6.2	−0.30	−0.30	−0.24	27,000			−3.17	7.6	16	20	17		50
B5	−1.1	−2.2	−5.7	−0.16	−0.16	−0.09	16,000			−1.39	4.0	10	32	7		25
A0	+0.6	−0.6	−4.9	0.00	0.00	+0.01	10,400			−0.40	2.6	6.3	40	3.6		16
A5	+2.1	+0.3	−4.5	+0.15	+0.15	+0.07	8200			−0.15	1.8		50	2.2		13
F0	+2.6	+0.6	−4.5	+0.30	+0.30	+0.24	7200			−0.08	1.3		63	1.8		13
F5	+3.4	+0.7	−4.5	+0.45	+0.45	+0.45	6700	6500	6200	−0.04	1.2	4.0	80	1.4		10
G0	+4.4	+0.6	−4.5	+0.60	+0.65	+0.76	6000	5500	5050	−0.06	1.04	6.3	100	1.1	2.5	10
G5	+5.2	+0.3	−4.5	+0.65	+0.86	+1.06	5500	4800	4500	−0.10	0.93	10	126	0.9	3	13
K0	+5.9	+0.2	−4.5	+0.81	+1.01	+1.42	5100	4400	4100	−0.19	0.85	16	200	0.8	4	13
K5	+8.0	−0.3	−4.5	+1.18	+1.52	+1.71	4300	3700	3500	−0.71	0.74	25	400	0.7	5	16
M0	+9.2	−0.4	−4.5	+1.39	+1.65	+1.94	3700	3500	3300	−1.20	0.63		500	0.5	6	16
M5	+12.3	−0.5	−4.5	+1.69	+1.85	+2.15	3000	2700		−2.10	0.32			0.2		

*All class Ia stars have an absolute visual magnitude of −0.7.
BC is bolometric correction.